CHECKLIST

# CHEMTECH

JANUARY 1986

**Nerds who changed the world** 7 ☐ **Suplee** reviews Levy's book about hackers.

**Unleashing the thinking animal** 8 ☐ To foster creativity, recognize and remove the inhibitors that **Pacifico** fingers.

**America's edible complex** 10 ☐ In the days of synthetic textured protein it was said that changing people's eating habits was more difficult than changing their sex habits. But eating and associated chemistries have changed, per **Chalmers.**

**Congressional Fellows** 16 ☐ An entry point to an interesting alternate career path is outlined by **Rosenblum** and **Wolfe.**

**High tech—Can higher education meet the challenge?** 21 ☐ Formal classes cannot teach entrepreneurship. **Roscher** outlines what the university can do, however.

**Hot line cools two nuclear trigger fingers** 24 ☐ How the U.S. and USSR "reach out and touch" on crucial occasions is explained by **Pett.**

**Mergers: Some work, some don't Part 2** 28 ☐ Like marriage, corporate mergers require a getting-acquainted period to succeed. How that's done without engagement rites is outlined by **Rosenbloom.**

**Return on investments: Myth and reality** 30 ☐ So you think you're making money? **Shinnar** and **Dressler** think otherwise after inflation is removed.

**Adhesives: Bellwether of chemical specialties business** 44 ☐ Myriad uses mean myriad growth opportunities, says **Broxterman.**

**CO as comonomer** 48 ☐ Now here's an interesting way to use coal or any other carbon source. **Sen** shows how.

**Elastomeric seals** 52 ☐ As we do things faster and under more extreme conditions, we need better materials. **Ender** shows how such a problem area is being handled.

**Anionic clay minerals** 58 ☐ Want a catalyst? Adsorbent? Ion exchange? Medical material? **Reichle** has them all.

1 ☐ **However . . .** in which **Noether** is concerned about planning . . . by the State.

2 ☐ **P.S.** in which are follow-up items on predicting carcinogenicity and on Star Wars' beneficiaries, animal models, and amorphous silicon.

3 ☐ **Heart Cut** in which **Dolbear** and **Bisio** call attention to concepts in the chemistry of chips, foams, and the blood–brain barrier.

14 ☐ **View from the Top** in which **Landau** introduces the joys of micro supply-side economics.

42 ☐ **Well Said!** in which **O'Hayre** slays the jargon dragon.

57 ☐ ***TECHGRAM Japan***

OBC ☐ **The Last Word** turns to drugs—a new one you'll love.

**Volume 16, No. 1, pages 1–64 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine JANUARY 1986

CHECKLIST

# CHEMTECH

FEBRUARY 1986

**Handling stress** 70 ☐ Here are hints from Hilton hotels that work for travelers . . . through life.

**Catalysis: The craft according to Houdry** 72 ☐ Whenever we review accomplishments in catalysis we wonder how Houdry mustered co-workers' energies. **Mills,** who was one of them, tells us.

**How does R&D fit in?** 76 ☐ Here's what you can learn about R&D's role by talking with 250 executives who have varying responsibilities. **Szakonyi** summarizes.

**Instrumentalities: A concept of how science is done** 80 ☐ Why invest so hugely in research equipment? This seminal paper by **deSolla Price** contains the justification.

**Opportunities in chemistry: Instrumentation** 83 ☐ Here is one of the portions of the **Pimentel** report that's directed to those who practice chemistry professionally.

**Reflections of an editor** 87 ☐ Founding Editor **Neurath** of *Biochemistry* tells about his job. (Included are reports of those who "refereed" his paper.)

**The two languages** 92 ☐ In the age of information, it's disquieting to learn how misunderstood seemingly clear statements can be. **Beerbower** illustrates.

**Petrochemicals from Saudi Arabia** 96 ☐ The locus of petrochemical production has shifted. **Nassar** explains what that portends.

**Cancer and chemicals . . . and vegetables** 100 ☐ It's time to speak of cabbages and. . ., says **Wong.**

**Controlled release: Three mechanisms** 108 ☐ Designing drug–polymer systems that "leak" as desired is described by **Langer, Siegel, Brown, Leong, Kost,** and **Edelman.**

**Discovery and development of olefin disproportionation** 112 ☐ How often does a wholly new organic reaction get discovered these days? And how often does it find commercial use? **Banks's** reaction did both.

**Whither microengineering?** 118 ☐ The techniques used to miniaturize electronic circuits can also be used to make . . . well, read **Hirschfeld,** and you'll see.

**Alarms: Fewer is better** 124 ☐ Essential to smooth plant operation as well as safety, alarms are often added as an afterthought. **Andow** outlines a more efficient alternative.

65 ☐ **The Industrial Chymist** suggests one way to view the Pimentel report.

66 ☐ **Heart Cut** in which **Kreps** and **Bisio** made selections based on their utility.

68 ☐ **View from the Top** in which **Opel** recommends that the openness of science be the paradigm for other activities.

94 ☐ **Guest Editorial** in which physicist **Teller** explains why nuclear power is good for people.

111 ☐ ***TECHGRAMJapan***

OBC ☐ **The Last Word** in which **Koshland** visits with a visitor from outer space.

**Volume 16, No. 2, pages 65–128 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

*The Innovator's Magazine* **FEBRUARY 1986**

UNIVERSITY OF ALBERTA

CHECKLIST

CHEMTECH

MARCH 1986

**Teaching polymer chemistry** 136 ☐ We're not doing enough teaching, says Speed **Marvel.**

**Up the technical ladder** 138 ☐ Here are a top firm's top technical people. **Koerner** tells what they did to get where they are.

**A short, short patent course** 144 ☐ Why they teach so little about intellectual property in schools has never been clear, but **Cichelli** helps rectify things.

**Opportunities in chemistry: New reaction pathways** 150 ☐ Here's what the **Pimentel** report has to say about challenges chemists will soon face.

**Technology from the Soviet bloc: More than meets the eye** 158 ☐ A third of the world's technical pros work in Eastern bloc countries. They must be producing some things of value, some things from which we can benefit. **O'Meara** tells how.

**Before you market an agricultural chemical** 164 ☐ Getting a new product out ain't easy, especially if it has to pass government agencies. **Gardiner** takes us through the process.

**The spaces between the functions on a chip** 168 ☐ As integrated circuits get more crowded, the real trick is keeping things from bumping into each other. **Pogge** explains the chemist's role.

**Engineering ceramics: Where do they fit in?** 174 ☐ Just look at what inorganic chemistry will be making, say **Goodwin** and **Sagarese.**

**Biosurface chemistry for fun and profit** 178 ☐ The skin is the body's largest organ, but that's just the beginning of the fascination of biosurfaces. Explore them with **Baier** and **Meyer.**

**NMR of plastics** 186 ☐ The achievements of recent advances in solid-state NMR are nowhere more apparent than in polymers, says **Jelinski.**

129 ☐ **The Industrial Chymist** plays games . . . meaningful ones.

131 ☐ **Heart Cut** in which **Kreps** and **Thyagarajan** distill the literature for innovation and its precursors.

134 ☐ **Write On** in which we hear about the missing battery and Everyman's chemistry.

134 ☐ **P.S.** in which there's more on oil and expenditures.

135 ☐ **View from the Top** in which **Simpson** gives us some precepts by which to live.

147 ☐ **The best of 1985** in which the winner of the Leo Friend Award is announced.

149 ☐ ***TECHGRAMJapan***

OBC ☐ **The Last Word** supplies you with an improved 1040 form.

**Volume 16, No. 3, pages 129–192 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

*The Innovator's Magazine* **MARCH 1986**

## Up the technical ladder

**Page 138**

**CHEMTECH**

**APRIL 1986**

**How I got my company back** — 201 ☐ Here's the story of Cavedon Chemical Company's acquisition and reacquisition by **Cavedon.**

**On the functionality of committees, boards, and panels** — 204 ☐ Simple thermodynamic and physical relationships lead **Old** to some new insights into how groups work (or don't).

**The marvelous properties of thiotimoline** — 208 ☐ To avoid what happened last April, we offer this caution: This article is not suitable for a term paper. But what that **Asimov** has written is?

**Organizations' organizations**

**The Conservation Foundation** — 215 ☐ Here's a different kind of environmental organization, one funded by sophisticated groups so that it doesn't have to alarm to raise money. **Davies** tells what it does.

**Competing with the new producers** — 218 ☐ Those who sold oil now sell chemicals, too. **Glass** suggests means to deal with this new competition, using polyethylene, styrene, and glycol as examples.

**Sixteen ways to mess up an experiment** — 228 ☐ If you're still testing one variable at a time, you're probably doing 15 other things wrong, says **Hendrix.**

**Permselective membranes separate gases** — 232 ☐ Materials technology and complexation chemistry are where the challenge lies in this promising field, note **Baker** and **Blume.**

**Microbial surfactants** — 239 ☐ Moving heavy oils illustrates the new job that **Hayes, Nestaas,** and **Hrebenar** have given to bugs.

**The spaces between the functions on a chip: Part 2** — 244 ☐ As integrated circuits get more crowded, the real trick is keeping things from bumping into each other. **Pogge** explains the chemist's role.

**Simple enols** — 250 ☐ We learn early that carbonyl compounds always contain more or less of their unstable tautomers. So? **Kresge** elaborates.

193 ☐ **The Industrial Chymist** pokes April Fool's fun at technical linguistics.

194 ☐ **P.S.** in which we follow up on the utility of optical resolution, mergers and acquisitions, Star Wars, and environmental saviors.

196 ☐ **Heart Cut** in which **Thyagarajan** and **Kreps** treat microwave ovens and very-low-density polyethylene.

200 ☐ **View from the Top** in which **Warren** yells to innovators, "Look out!"

223 ☐ ***TECHGRAMJapan***

224 ☐ **Well Said!** in which **O'Hayre** punctures pompous prose.

OBC ☐ **The Last Word** asks a significant question.

**Volume 16, No. 4, pages 193–256 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine **APRIL 1986**

**Page 228**

# CHECKLIST

**CHEMTECH**
**JUNE 1986**

**So wrapped up in business . . . we forget the customer** — **332** ☐ Why little companies work is explained by **Falvey.**

**Speaking about risk** — **336** ☐ How do you explain risk without generating fear? **Press** tries his hand at an answer.

**If you would lead . . .** — **339** ☐ The role of the leader, now that participative management is here, is delineated by **Cotterman.**

**Scaling up** — **344** ☐ The transition of a concept from research to development to manufacturing is akin in pain and potential to birth. See how it's eased, according to **Heitmann** and **Rhees.**

**Riding the long wave** — **352** ☐ Here we are, cresting an economic wave. Will **Valéry's** ideas help us stay afloat?

**Enzymes that work in organic solvents** — **354** ☐ No, Virginia, water isn't necessary to realize the speed and specificity of nature's catalysts. **Klibanov** illustrates.

**Pulp, paper, and biotechnology** — **360** ☐ The surprise isn't that microorganisms can play several roles in pulp processes. It's that we haven't yet exploited those roles. **Jurasek** and **Paice** bring us up to date.

**How textiles wear** — **366** ☐ Modern instrumentalities let **Zeronian, Alger, Ellison,** and **Al-Khayatt** see how materials fail.

**A kinetics toolbox** — **372** ☐ If you're trying to find optimum reaction conditions, try using your computer. **Solodar** shows how.

**Listening in on solid materials** — **378** ☐ Catalysts are what **Spencer's** most interested in, but here's a technique with a range of uses.

**321** ☐ **The Industrial Chymist** asks, "Do you really know what you're doing?"

**324** ☐ **Write On** in which environmental advocates are compared and a new World Series is proposed.

**324** ☐ **P.S.** in which there's more on radioactive waste, DNA probes, and dowsing.

**326** ☐ **Heart Cut** in which **Piccolini** and **Casper** are intrigued by process design software, ceramics' potentials, and a new newsletter.

**331** ☐ **View from the Top** in which **Copulsky** explains the difference between a researcher and an entrepreneur.

**334** ☐ **Guest Editorial** in which **Donnelly** asks readers what in the news they discuss.

**335** ☐ ***TECHGRAMJapan***

**OBC** ☐ **The Last Word** in which **Iles** translates apparent English into real English.

**Volume 16, No. 6, pages 321–384 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

*The Innovator's Magazine* **JUNE 1986**

CHECKLIST

# CHEMTECH

JULY 1986

**A technology transfer experience** 392 ☐ The world truly is the oyster of those who seek to absorb "outside" technology, notes **Korenko.**

**Attitudes toward women scientists** 396 ☐ Have we come a long way, baby? **Walton** is not so sure.

**Managing a project** 402 ☐ Perhaps if we broke up continuing activities into "projects" we could better handle things. **Langley** and **Meyer** provide a framework for the test.

**Innovation from start to finish** 405 ☐ How the business incubator at RPI works is recounted by **Abetti.**

**Keep your marketing options open** 414 ☐ As chemical products become increasingly differentiated, **Bothof**'s ideas gain pertinence.

**Copyright: Let's be practical!** 416 ☐ Here's a nuts-and-bolts guide through the information maze by **Polansky** and **Elss.**

**A nuclear ritual for the ages** 420 ☐ How DOE recommends that we pass forward the legacy of nuclear waste is described by **Reid.**

**A mass transfer tutorial** 422 ☐ More chemists have been fooled by mass transfer phenomena than by any other phenomena. **Cussler** removes their mystery.

**Materials for biotech** 426 ☐ When two emerging disciplines collide, you can't help but get the kind of excitement **Hoffman** describes.

**Growing cells on a 2000-gallon scale** 433 ☐ Isn't it about time we began to worry about scaling up bioprocessing? **Phillips** et al. show how.

**Cancer and chemicals . . . in vegetables: Part 2** 436 ☐ To understand synthetic carcinogens, it helps to understand natural ones. **Wong** here completes his explanation of the latter.

**Curing rubber** 444 ☐ Talk about molecular engineering—have you ever taken a really good look at rubber? **Hertz** has.

385 ☐ **The Industrial Chymist** in which **Luberoff** looks at America's funny ways.

386 ☐ **Write On** in which **Hartford** explains environmental movements.

387 ☐ **Heart Cut** in which **Piccolini** and **Bisio** call attention to coming acquisitions, glued-together pilot plants, and the foci of Japanese emerging technologies.

390 ☐ **View from the Top** in which **Parkinson** extends his laws into the edge of information.

404 ☐ ***TECHGRAMJapan***

413 ☐ **The Division's Page** in which **Chan** extends an invitation to the First World Chemical Congress for Marketing and Business Research.

OBC ☐ **The Last Word** in which is proof that the international language of chemistry is not "English mit a mittle European accent."

**Volume 16, No. 7, pages 385–448 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15. Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881, (203) 226-7131

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time, (b) North American claim was made 90 days beyond issue date, (c) other claim was made one year beyond issue date

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W. Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine **JULY 1986**

CHECKLIST

# CHEMTECH

**AUGUST 1986**


**Molasses in January** — 456 — Now here's an ecological disaster, circa 1919. **Park** tells the tale.

**An investment in the future** — 458 — Child care promises to be one of the most important issues facing employers in the 1980s. **Garfield** tells how he's faced it head on.

**The new R&D management** — 462 — The new R&D is exorbitantly expensive. **David** suggests new ways to manage it.

**The raw materials of creativity** — 466 — Gaining new constructs requires that many previously unrelated concepts be in one head. Getting them there is what concerns **Prausnitz.**

**Tax reform scorecard** — 469 — It's time to tally up, for better and worse, the changes new legislation may bring. Listen to **E. F. Hutton.**

**The mythology of innovation: A skunkworks tale Part 2** — 472 — Here **Peters** continues his discourse on innovation; how it does and does not occur.

**Reshaping the chemical industries** — 478 — "The downstream stampede" is only one of the trends **Kline** characterizes in examining the differentiation of the old CPI.

**Prehistoric ceramic technology** — 484 — As ceramics emerge as the materials of the future, it's illuminating to look at materials of the past, as **Allen** and **Hamroush** did.

**The black art: Formulation** — 490 — Functional products don't come much more complex than those made of rubber. **Grossman**'s description of how they're put together is thus useful for those who design for function.

**Practical applications of surface analysis** — 494 — If you want to understand adhesion, catalysis, biocompatibility, corrosion, or crystallization, you'll be interested in the techniques **Batich, Holloway,** and **Kosinski** use.

**Polymers from diisopropenylbenzene** — 500 — "A rich chemistry" is how **Colvin** and **Muse** describe the behavior of these difunctionals.

**Liquid fuel from carbohydrates** — 506 — The trouble with biomass as fuel is that it's solid, has too little H, and has too much $O_2$. **Chen, Degnan,** and **Koenig** attack all three problems catalytically.

449 **The Industrial Chymist** is upset over hard sell (re: insensitive, self-centered sell).

451 **Write On** in which is found poetry and challenge, and more on "Urine Trouble."

452 **Heart Cut** in which **Kreps** and **Dolbear** act as editors.

455 **View from the Top** in which **Campbell** acts as a marriage broker.

489 ***TECHGRAMJapan***

OBC **The Last Word** in which you appraise your superior, with **Townsend**'s help.



**Volume 16, No. 8, pages 449–512 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881, (203) 226-7131

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date



**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine AUGUST 1986

Page 478

**The workaholic boss** 522 ☐ An 18-hour-a-day menace is how **Falvey** characterizes certain execs.

**Through college with pencil, pad, and computer** 524 ☐ Here comes the new generation, the ones to whom **Fenster** gave computers in their freshman year.

**Technology exchange: An inside job** 528 ☐ How corporate show and tell is used to coordinate a big outfit's efforts is related by **Menger** and **Colby**.

**Risk communication** 533 ☐ Why is it so tough to discuss risk with the public? **Ruckelshaus** attempts an answer.

**Opportunities in chemistry: Surfaces and condensed phases** 536 ☐ Here's where chemistry's action will be, according to "the **Pimentel** Report."

**Even live catalysts die** 542 ☐ Because genetically engineered microbes aren't as vigorous as wild ones, we encounter what looks like catalyst poisoning in fermentation. How we design around that problem is explained by **Monbouquette** and **Ollis**.

**The process profile** 552 ☐ Sooner or later each new process must be subject to economic evaluation. How to do it sooner is detailed by **Berkoff**, **Kamholz**, **Rivard**, **Wellman**, and **Winicov**.

**Porous alumina membranes** 560 ☐ Ever think of using an inorganic to make semipermeable elements? **Leenaars**, **Kelzer**, and **Burggraaf** did.

**Solubility: A *new* look** 566 ☐ Here, at last, is a general equation for predicting solute–solvent interactions. This scheme, useful in biological as well as chemical systems, is the product of **Kamlet**, **Doherty**, **Abboud**, **Abraham**, and **Taft**.

513 ☐ **The Industrial Chymist** in which we learn how to end a good thing.

514 ☐ **Write On** in which a big question of data interpretation gets an airing, as does a process suggested by a CHEMTECH article.

518 ☐ **Heart Cut** in which **Dolbear** and **Thyagarajan** point out what grabbed their fancy.

520 ☐ **View from the Top** in which jurist **Seitz** examines technology's potential negative consequences.

OBC ☐ **The Last Word** in which **Mulligan** says "Quit, already."

**Volume 16, No. 9, pages 513–576 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

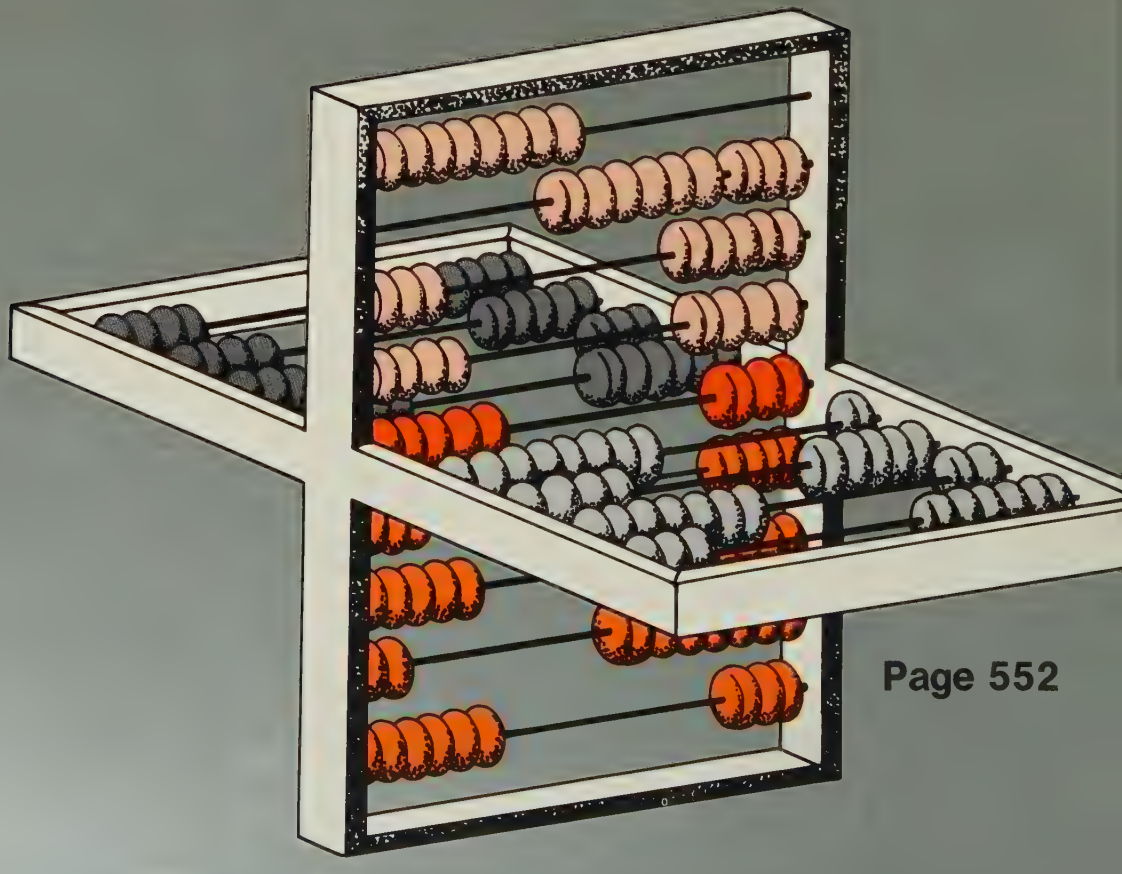
**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine SEPTEMBER 1986



Page 552

CHECKLIST

# CHEMTECH

OCTOBER 1986

**Scientific trivial pursuit** 582 ☐ When journals publish too many papers, progress is likely to perish. We can solve this dilemma, **Bard** declares.

**Probing more of the mind** 588 ☐ For problem solvers, memory isn't enough—what's needed is generative recall; how to differentiate between these two requisites is shown by **Stalger**.

**Liability and the insurance shortage** 592 ☐ Who cares how big today's liability judgments are? All of us should, if we want to be able to buy insurance in the future, **Reid** warns.

**Chernobyl** 596 ☐ A tale of two cities: although Munich and Konstanz are only 120 miles apart, they experienced significantly different effects from the nuclear plant accident in the Ukraine, relate **Hohenemser**, **Deicher**, **Ernst**, **Hofsäss**, **Lindner**, and **Recknagel**.

**Small-scale power production** 606 ☐ Cogeneration is a growth industry, windmills are springing up in California, and photovoltaics are on the horizon. **Flavin** tells why.

**Industry–university research agreements** 612 ☐ How divergent interests can result in synergistic cooperation is explained by **MacCordy**.

**Scaling up membrane filter systems** 616 ☐ Between lab demonstration and plant start-up lie some well-defined steps; **Gabler** and **Messinger** illustrate.

**Water and rubber do mix** 622 ☐ When butyl rubber absorbed large amounts of water, an explanation was required. Read what **Edwards** discovered.

**A modern chemist stays informed with Gmelin** 629 ☐ The venerable *Handbuch der Theoretischen Chemie* keeps modern chemists up to date; **Froböse** lets us look inside.

**Thermal-wave microscopy** 634 ☐ When electron or optical microscopes won't let you identify surface structures, thermal waves may, state **Nguyen** and **Rosencwaig**.

577 ☐ **The Industrial Chymist** has figured out why so many professions no longer get any respect.

578 ☐ **Write On** in which are found comments on the Pimentel report, separation membranes, and Soviet technology.

579 ☐ **Heart Cut** in which editors **Kreps** and **Dolbear** write about a new computer magazine, selenium chemistry, and ultraefficient filters.

584 ☐ **View from the Top** in which **Cutler** urges us to think before we plan.

585 ☐ **Book Review** in which **Massingill** probes *Intrapreneuring,* Gifford Pinchot III's how-to volume that helps innovators work within the corporation and managers produce a creative environment.

OBC ☐ **The Last Word** in which the power of coordinates is illustrated.

**Volume 16, No. 10, pages 577–640 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211

**Editorial Matters:** Refer all editorial matters to B. J Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date, (c) other claim was made one year beyond issue date

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law

Copyright © 1986 by the American Chemical Society

# CHEMTECH

The Innovator's Magazine OCTOBER 1986

CHECKLIST

# CHEMTECH

**NOVEMBER 1986**


**Fuzzy thinking** 648 ☐ The trouble with computers, when it comes to their thinking, is that they're locked into two-valued logic—yes or no. What's being done to make them think more like we do is described by ***The Economist***.

**Roles and responsibilities in our technological society** 650 ☐ "A corporation is a composite of all its people." Here's how CEO **Giacco** sees your part in that.

**The rise and fall of Arab oil power** 654 ☐ Whither oil now? If that's on your mind, consult **Kanovsky**, who's been so right in the past.

**The Chemical Industry Institute of Technology** 658 ☐ **Organizations' organizations**
The closest thing that the U.S. chemical industry has to a legal, shared research activity is described by **Neal**, its president.

**Reflections** 663 ☐ The attributes that lead us to and through research are pondered by **Juaristi**.

**R&D and diminishing returns** 665 ☐ Project selection is the critical element in R&D management. **Kravitz** explores one selection parameter that's often neglected.

**Science policy in the Soviet Union** 668 ☐ So how do Russian technologists decide what to work on? Or is it decided for them? **Sheinin** responds.

**How to run a process plant** 672 ☐ Creativity's okay, but in manufacturing, uniformity's better, says **Bennett**.

**Membrane bioreactors** 676 ☐ Instructions on how to run fermentations continuously come from **Cheryan** and **Mehaia**.

**Used oil: Resource or pollutant?** 682 ☐ Most used motor oil ends up floating on our waterways. Why? **Brinkman** attempts an answer.

**Float or sink?** 685 ☐ Tons of stuff are refined by froth flotation, yet this method is seldom considered as a solution to new problems or a market for new surfactants. **Hsieh** provides a primer on this neglected operation.

**Single crystals: Standards for industrial catalysis** 688 ☐ Bringing the technology and science of catalysis closer together has been an elusive goal, but **Boudart** keeps trying.

**Polyurethanes based on polyisobutylenes** 694 ☐ The hard and soft of these challenging resins is revealed by **Kennedy**.

**Macromolecular asymmetry can produce optical activity** 698 ☐ How helix coils and other macro phenomena can alone produce optical antipodes is revealed by **Vogl**.

641 ☐ **Guest Editorial**
in which **Leeman** introduces the safety circle.

642 ☐ **Write On**
in which the focus is on health.

642 ☐ **P. S.**
in which we look again at our next limiting resource, at responsibilities, and at accomplishments in catalysis.

644 ☐ **Heart Cut**
in which **Piccolini** and **Dolbear** are charged with gleaning the literature for portents of innovation.

647 ☐ **View from the Top**
in which **Moffitt** seeks the best of us.

OBC ☐ **The Last Word**
in which there's a did-it-yourselves cartoon.



**Volume 16, No. 11, pages 641–704 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.



**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

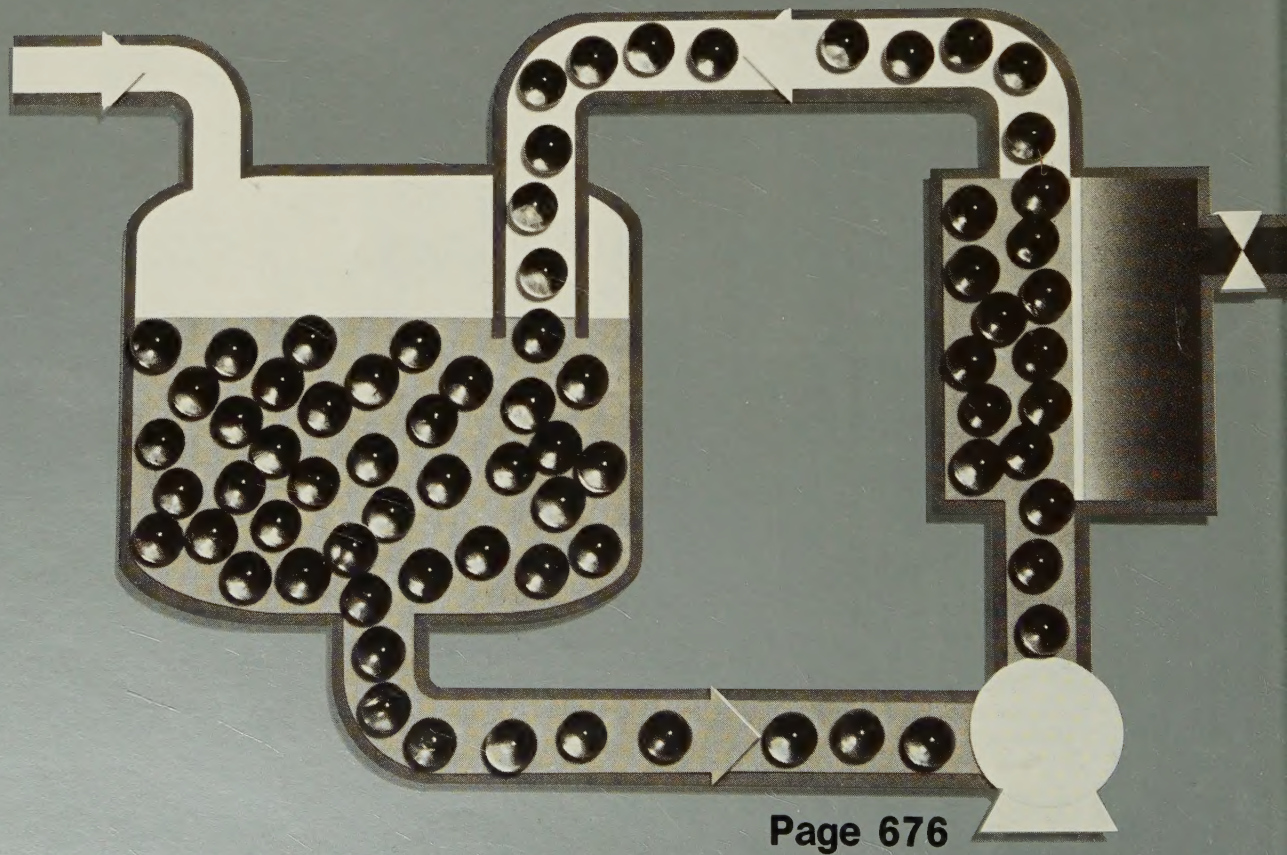
**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

*The Innovator's Magazine* **NOVEMBER 1986**



**Page 676**

CHECKLIST

# CHEMTECH

DECEMBER 1986

**The video game syndrome** 705 ☐ Tell the truth: Do you really need that PC on your desk? **Strehlo** thinks not.

**Legends of Max Tishler and his times** 712 ☐ The praises of an innovator and pioneer in industrial research are sung by **Cram**.

**Genesis of a specialty chemical company** 716 ☐ As functional chemicals enterprises gain prominence, it's enlightening to see how **Halpern**'s made it.

**Why the President is right about Star Wars** 722 ☐ Many technologists doubt the technical feasibility of the Strategic Defense Initiative. **Jastrow** presents the counter arguments.

**Composite electroceramics** 732 ☐ Here is yet another window of opportunity opened by the demands of the microelectronics industry. **Newnham** looks through.

**Membrane technology in the metal finishing industry** 740 ☐ Here's the latest on recovering chemicals and saving the environment. It's by **Werschulz**.

**Making isoprene from *n*-butenes** 746 ☐ Isoprene, though useful and ubiquitous in nature, has eluded efforts at efficient synthesis—until now. **Forster**, **Sluka**, and **Vavere** show how it's done.

**Lube oil additives** 752 ☐ Another of those functional chemicals niches is reviewed by **Garcia-Borras**.

**Measurement and calibration** 756 ☐ "Why do you keep running 'knowns'? Don't you need answers on real samples *now*?" some managers ask. **Taylor** answers.

707 ☐ **Write on** in which there's pure poetry.

707 ☐ **P.S.** in which there's a validation of predictions about bioactivity.

708 ☐ **Heart Cut** in which **Bisio**, **Piccolini**, and **Dolbear** pick out new materials, processes, and procedures.

720 ☐ **View from the Top** in which **Irani** explains the leveraged buyout.

728 ☐ **The Industrial Chymist** in which **Luberoff** plays organizational psychologist.

745 ☐ ***TECHGRAMJapan***

765 ☐ **1986 Index** in which there's an effort to classify CHEMTECH concepts.

IBC ☐ **Author's Guide** in which your manuscripts are invited.

OBC ☐ **The Last Word** in which **Charlton** helps you complete your business education.

**Volume 16, No. 12, pages 705–768 ISSN 0009-2703 CHTEDD**

CHEMTECH (ISSN 0009-2703) is published monthly by the American Chemical Society at 1155 16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to CHEMTECH, Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210.

**Subscriptions—1-year prices:** Members, $30; Nonmembers (individual personal use), $40; Companies, institutions, libraries, $215; Student members, $15; Mexico and Canada add $6/year for postage. Europe add $11/year for postage. All other countries add $17/year for postage. All foreign subscriptions are sent by air freight. Send payment to ACS Controller, 1155 16th St., N.W., Washington, D.C. 20036. Single copies, $19 (current), $23 (pre-1986). Phone orders can be placed for printed, microfiche, and microfilm editions by calling, toll free, the sales office at (1)(800) 424-6747 from anywhere in the continental U.S. From Washington, D.C., call 872-8065. Visa, Master Card, and American Express accepted. Rates above do not apply to nonmember subscribers in Japan, who enter subscriptions with Maruzen Co. Ltd., 3-10 Nihon bashi 2-chome, Chuo-ku, Tokyo 103, Japan; (03) 272-7211.

**Editorial Matters:** Refer all editorial matters to B. J. Luberoff, Editor, CHEMTECH, American Chemical Society, 1155 16th St., N.W., Washington, D.C. 20036.

**Advertising:** Centcom, Ltd., T. Koerwer, Pres., 25 Sylvan Road South, Westport, CT 06881; (203) 226-7131.

**Service:** For change of address, send old label with new address to ACS Membership and Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. Allow 6 weeks to effect change. Refer claims for missing issues, information on status of accounts, etc., to this office. Claims for missing issues will not be allowed if (a) notice of address change was not received in specific time; (b) North American claim was made 90 days beyond issue date; (c) other claim was made one year beyond issue date.

**Disclaimer**—The American Chemical Society assumes no responsibility for opinions advanced by contributors to its publications. Views expressed in the editorials are those of the author and do not necessarily represent the official position of the Society.

**Reproduction:** To obtain reprint permission, contact Copyright Administrator, ACS, 1155 16th St., N.W., Washington, D.C. 20036; (202) 872-4367, TDD (202) 872-8733. For CHEMTECH articles copyrighted by ACS, free permission will be granted to make copies for personal, noncommercial, or internal use. This permission does not extend to copying for promotional purposes, creating new collective works, or resale.

Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

Copyright © 1986 by the American Chemical Society

# CHEMTECH

*The Innovator's Magazine* **DECEMBER 1986**

**Page 756**